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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,512	01/27/2004	Ares J. Rosakis	06618/929001/CIT 4030	2208
20985	7590	10/02/2006	EXAMINER	
FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			JARRETT, RYAN A	
			ART UNIT	PAPER NUMBER
			2125	

DATE MAILED: 10/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/766,512	<b>Applicant(s)</b> ROSAKIS ET AL.	
	<b>Examiner</b> Ryan A. Jarrett	<b>Art Unit</b> 2125	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 1-6, 8-16, 18, 21-26 and 28-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7, 17, 19, 20, 26 and 27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/1/04, 5/26/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group IV Species II in the reply filed on 08/07/2006 is acknowledged.

Claims 1-6, 8-16, 18, 21-26, and 28-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention (claims 1-6, 8-15, 18, 21-26, and 28-31) and species (claim 16), there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 08/07/2006.

It is noted that claim 26 was inadvertently included in Group IV, when in fact it should have been included as one of the linking claims linking inventions II and III, due to its dependence on linking claim 25. It is noted however that claim 26, while essentially withdrawn from consideration for the purposes of future communications, is being examined here (in the context of claim 20) out of fairness to the Applicant.

Therefore, claims 7, 17, 19, 20, and 27 are presented below for examination, with an additional comment on claim 26.

### ***Priority***

2. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) is acknowledged. It is noted however that the Examiner has not yet fully evaluated the provisional Application to determine the level of support it provides for the instant claims, as it is not considered necessary at this time.

***Information Disclosure Statement***

3. The information disclosure statements (IDS) submitted on 11/01/2004 and 05/26/2004 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

***Drawings***

4. The drawings are objected to because Figs. 1A, 1B, 2, and 5-11 include dark shading that makes it difficult to discern reference characters contained within the dark shading. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 7, 17, 19, 20, 26, and 27 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims are generally directed to an abstract idea (§101 judicial exception). For claims including such excluded subject matter to be eligible, the claim must be for a practical application of the abstract idea. Diehr, 450 U.S. at 187, 209 USPQ at 8; Benson, 409 U.S. at 71, 175 USPQ at 676.

To satisfy section 101 requirements, the claim must be for a practical application of the §101 judicial exception, which can be identified in various ways: (1) The claimed invention “transforms” an article or physical object to a different state or thing, or (2) The claimed invention otherwise produces a useful, concrete and tangible result.

Practical Application by Physical Transformation

In the present case, independent claims 7, 20 and 27 do not “transform” an article or physical object to a different state or thing. Although claim 7 includes a preliminary “processing” step that may be considered to be a “physical transformation”, this step is not the final result of the claimed invention nor is it considered to be “what the Applicant has invented and is seeking to patent”, and thus is not germane to the discussion.

Practical Application That Produces a Useful, Concrete, and Tangible Result

For eligibility analysis, physical transformation “is not an invariable requirement, but merely one example of how a mathematical algorithm [or law of nature] may bring about a useful application.” AT&T, 172 F.3d at 1358-59, 50 USPQ2d at 1452. In determining whether the claim is for a “practical application”, the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is “useful, tangible and concrete”.

#### “TANGIBLE RESULT”

The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different thing. However, the tangible requirement does require that the claim must recite more than a §101 judicial exception, in that the process claim must set forth a practical application of that §101 judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because had “no substantial practical application”). “[A]n application of a law of nature or mathematical formula to a ... process may well be deserving of patent protection.” Diehr, 450 U.S. at 187, 209 USPQ at 8 (emphasis added); see also Corning, 56 U.S. (15 How.) at 268, 14 L.Ed. 683 (“It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted...”). In other words, the opposite meaning of “tangible” is “abstract”.

In the instant case, the final result achieved by the claimed invention (claims 7, 20 and 27) is merely “compute”. This abstract result fails to provide the required “real-world result” that satisfies the “tangible result” requirement.

Where the final result is what has been determined, calculated, selected, decided, computed, etc. without using what has been determined, calculated, selected, decided, computed, etc. in a disclosed practical application or at least making what has been determined, calculated, selected, decided, computed, etc. available for use through some form of conveyance (for example display, print, sound, transmission, etc.) or at least temporary storage somewhere, then a tangible result has not been achieved.

Although system claim 20 recites a tangible item such as a substrate holder, the tangible system merely functions to implement an abstract idea of “compute”, and thus fails to produce any tangible real-world result. The arrangement of hardware in system claim 20 is not what the Applicant has invented and is seeking to patent, i.e., Applicant is relying on the programmed functionality of the hardware for patentability, and that programmed functionality is an abstract idea rather than a practical application.

Claims 17, 19, and 26 depend from claims 7 and 20, and incorporate the same deficiencies. Claim 26 further fails to rectify the aforementioned deficiencies of claim 20. Claims 17 and 19, however, rectify the aforementioned deficiencies of claim 7 as these claims both produce a tangible final result.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 7, 17, 19, 20, 26, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 01/82335 A2. For example, WO 01/82335 A2 discloses:

7. **A method for fabricating a layered structure on a substrate, comprising:**

**processing a substrate to form at least one dielectric layer on the substrate and parallel line features embedded in the dielectric layer (e.g., Figs. 8A,8B);**

**obtaining local curvature information in an area of a line feature (e.g., Fig. 1 #102: “Optical Detection Module”, Fig. 1 #106: Curvature Signal”);**

**obtaining local temperature information in the area of the line feature (e.g., pg. 37 lines 1-4, pg. 38 lines 11-12); and**

**using analytical expressions to compute local stresses (e.g., Fig. 1: “Stress Data”) in the line feature from the local curvature information and the local temperature information of the line feature (e.g., pg. 20 Equation (1), pg. 30 Equations (5)-(10), pg. 32 line 21 – pg. 33 line 1), geometry information of the line feature (e.g., Fig. 8A: “b”), the dielectric layer (e.g., Fig. 8B: “t”), and the substrate (e.g., Fig. 8B: “h”), and material information of the line feature (e.g., Fig. 8A: “Cu line:  $E_1, \alpha_1$ ”), the dielectric layer (e.g., Fig. 8A: “SiO<sub>2</sub>:  $E_0, \alpha_0$ ”) and the substrate (e.g., Fig. 8A: “Si substrate:  $E_s, \nu_s, \alpha_s$ ”).**

17. **The method as in claim 7, further comprising:**



**computing a critical value for a change in curvature according to a failure criterion of the layered structure by using the analytical expressions** (e.g., pg. 33 lines 4-15: “Hence, when the difference either along or cross the line exceeds the acceptable level, the liability or performance of device may be considered as being unacceptable”, EN: *The “acceptable level” of curvature “difference” corresponds to the claimed “critical value for a change in curvature”*);  
**and**

**controlling a condition during fabrication to make a change in curvature to be away from the critical value** (e.g., pg. 33 line 22 – pg. 34 line 1: “Hence, one or more aspects of the fabrication or the design of the devices may be examined and modified to reduce the residual stresses within the acceptable range”).

**19. The method as in claim 7, further comprising adjusting a processing condition according to the computed local stresses** (e.g., pg. 17 lines 1-4).

**20. A system, comprising:**

**a substrate holder to hold a substrate** (e.g., Fig. 1 #130: “Sample Substrate”) **fabricated with a dielectric layer and parallel line features embedded in the dielectric layer** (e.g., Figs. 8A,8B);

**a sensing module** (e.g., Fig. 1 #102: “Optical Detection Module”) **to interact with the substrate to obtain information about a temperature** (e.g., pg. 37 lines 1-4, pg. 38 lines 11-12) **and curvatures** (e.g., Fig. 1 #106: Curvature Signal”) **of a line feature on the substrate;**  
**and**

**a processing module** (e.g., Fig. 1 #105: “Processing Module”) **programmed with analytical expressions to compute local stresses** (e.g., Fig. 1: “Stress Data”) **in the line feature**

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from curvature and temperature information of an area having the line feature (e.g., pg. 20 Equation (1), pg. 30 Equations (5)-(10), pg. 32 line 21 – pg. 33 line 1), geometry information of the line feature (e.g., Fig. 8A: “b”), the dielectric layer (e.g., Fig. 8B: “t”), and the substrate (e.g., Fig. 8B: “h”), and material information of the line feature (e.g., Fig. 8A: “Cu line:  $E_1$ ,  $\alpha_1$ ”), the dielectric layer (e.g., Fig. 8A: “SiO<sub>2</sub>:  $E_0$ ,  $\alpha_0$ ”) and the substrate (e.g., Fig. 8A: “Si substrate:  $E_s$ ,  $\nu_s$ ,  $\alpha_s$ ”).

26. The system as in claim 20 ~~25~~, wherein the layered structure comprises a capping layer (e.g., Fig. 8B #830) on top of embedded line features (e.g., Fig. 8B #810) and an adjacent top layer (e.g., Fig. 8B #820), wherein the processing module is programmed to include effects of the capping layer in the analytical expression (e.g., pg. 31 line 20 – pg. 32 line 12 Equations (11)-(12)).

27. A method, comprising:

providing a layered structure (e.g., Fig. 1 #130: “Sample Substrate”) comprises a plurality of layers stacked over one another and each having embedded line features (e.g., Figs. 8A,8B);

optically obtaining information on a surface of the layered structure (e.g., Fig. 1 #102: “Optical Detection Module”);

processing the optically obtained information to extract curvature information of the surface (e.g., Fig. 1 #106: Curvature Signal”); and

applying analytical expressions to compute local stresses (e.g., Fig. 1: “Stress Data”) in a line feature based on extracted curvature information and a local temperature at a

**location of the line feature** (e.g., pg. 20 Equation (1), pg. 30 Equations (5)-(10), pg. 32 line 21 – pg. 33 line 1).

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan A. Jarrett whose telephone number is (571) 272-3742. The examiner can normally be reached on 10:00-6:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ryan A. Jarrett  
Examiner  
Art Unit 2125



9/25/06